Claims

1. A method of manufacturing a semiconductor device, comprising the steps of:

loading a substrate into a reaction furnace,

performing in the reaction furnace a processing to the substrate,

performing, under a state that the substrate after the processing has been accommodated in the reaction furnace, a 1st purge by performing an evacuation and a supply of an inert gas to the reaction furnace by more than at least one time,

unloading the substrate after the processing out of the reaction furnace, and

performing ,after the substrate after the processing has been unloaded out of the furnace, before a substrate to be processed next is loaded into the reaction furnace, and under a state that at least a product wafer is not accommodated in the reaction furnace, a 2nd purge by performing the evacuation and the supply of the inert gas to the reaction furnace by more than at least one time,

wherein a pressure change quantity in the reaction furnace per unit time in the 2nd purge step has been made larger than a pressure change quantity in the reaction furnace per unit time in the 1st purge step.

2. A method of manufacturing a semiconductor device

according to claim 1, wherein the pressure change quantity in the reaction furnace per unit time in the 2nd purge step has been made larger than 30 Pa/sec and 500 Pa/sec or smaller.

3. A method of manufacturing a semiconductor device according to claim 1, wherein a difference between a maximum pressure and a minimum pressure in the reaction furnace in the 2nd purge step has been made larger than a difference between a maximum pressure and a minimum pressure in the reaction furnace in the 1st purge step.

4. A method of manufacturing a semiconductor device according to claim 1, wherein, in the 1st purge step and the 2nd purge step, the evacuation and the supply of the inert gas are repeated by plural times, and a cycle of the evacuation and the supply of the inert gas in the 2nd purge step has been made shorter than a cycle of the evacuation and the supply of the inert gas in the 1st purge step.

5. A method of manufacturing a semiconductor device according to claim 1, wherein, in the 1st purge step and the 2nd purge step, the evacuation and the supply of the inert gas are repeated by plural times, and a cycle number of the evacuation and the supply of the inert gas in the 2nd purge step has been made more than a cycle number of the evacuation and the supply of the inert gas in the 1st purge step.

6. A method of manufacturing a semiconductor device according to claim 1, wherein, in the 1st purge step and the

2nd purge step, the evacuation and the supply of the inert gas are repeated by plural times, in the 1st purge step the inert gas is supplied into the reaction furnace under a state that an exhaust valve, which has been provided in an exhaust line for exhausting an inside of the reaction furnace, has been opened, and in the 2nd purge step the inert gas is supplied into the reaction furnace under a state that the exhaust valve has been closed.

7. A method of manufacturing a semiconductor device according to claim 1, wherein the 1st purge step is performed under a state that a support, which has supported the substrate, has been accommodated in the reaction furnace, and the 2nd purge step is performed under a state that the support, which does not support at least a product substrate, has been accommodated in the reaction furnace.

8. A method of manufacturing a semiconductor device according to claim 1, wherein the 1st purge step is performed under a state that a support, which has supported the substrate, has been accommodated in the reaction furnace, and the 2nd purge step is performed under a state that the support, which has supported a dummy substrate without supporting a product substrate, has been accommodated in the reaction furnace.

9. A method of manufacturing a semiconductor device according to claim 1, wherein in the substrate processing step a gas containing boron is used.

10. A method of manufacturing a semiconductor device according to claim 1, wherein in the substrate processing step a boron-doped silicon film is formed on the substrate.

11. A method of manufacturing a semiconductor device according to claim 1, wherein in the substrate processing step monocilane (SiH_4) and boron trichloride (BCl_3) are used.

12. A method of manufacturing a semiconductor device according to claim 1, wherein the 2nd purge step is performed each time in every time the processing to the substrate is performed.

13. A method of manufacturing a semiconductor device, comprising the steps of:

charging a substrate to a support,

loading the support having been charged with the substrate into a reaction furnace,

performing in the reaction furnace a processing to the substrate,

unloading the support, which has supported the substrate after the processing, from the reaction furnace,

discharging, after the support has been unloaded, the substrate after the processing from the support,

loading, after the substrate after the processing has been discharged, the support into the reaction furnace without charging at least a product substrate to the support, and

performing a purge by performing, under a state that the

support not charged with at least the product substrate has been accommodated in the reaction furnace, an evacuation and a supply of an inert gas to the reaction furnace by more than at least one time without introducing a reactive gas into the reaction furnace.

14. A method of manufacturing a semiconductor device according to claim 13, wherein the purge step is performed under a state that a dummy substrate has been supported without supporting the product substrate to the support.

15. A method of manufacturing a semiconductor device according to claim 13, wherein the purge step is performed each time in every time the processing to the substrate is performed.

16. A method of manufacturing a semiconductor device according to claim 13, wherein a pressure change quantity in the reaction furnace per unit time in the purge step has been made larger than 30 Pa/sec and 500 Pa/sec or smaller.

17. An apparatus for processing a substrate, comprising:

a reaction furnace for processing the substrate,

a gas supply line for supplying a gas into the reaction furnace,

a loading/unloading device for loading and unloading the substrate into and from the reaction furnace, and

a controller which controls so as to perform, under a state that the substrate after the processing has been

accommodated in the reaction furnace, a 1st purge by performing an evacuation and a supply of an inert gas to the reaction furnace by more than at least one time, which controls so as to perform, after the substrate after the processing has been unloaded out of the reaction furnace, before a substrate to be processed next is loaded into the reaction furnace, and under a state that at least a product substrate is not accommodated in the reaction furnace, a 2nd purge by performing the evacuation and the supply of the inert gas to the reaction furnace by more than at least one time, and additionally which controls such that a pressure change quantity in the reaction furnace per unit time in the 2nd purge is made larger than a pressure change quantity in the reaction furnace per unit time in the 1st purge.